# OHIO STATE ENGINEER

• MAY •

1941

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# Grasp this valuable bearing knowledge NOW!

Inherent in the design of the Timken Tapered Roller Bearing is the answer to practically every bearing requirement.

The term "anti-friction" long has been inadequate as a bearing description—in fact ever since the Timken Bearing was introduced 46 years ago.

In order to fulfill every requirement a bearing must be more than an anti-friction bearing; it must also be able to carry radial loads, thrust loads, and every combination of both, as well as hold shafts in positive and accurate alignment.

All these requirements are contained within the scientific tapered design and precision construction of the Timken Bearing.

With a thorough knowledge of Timken Bearing design and application as part of your education you will be in position to solve practically any and every bearing problem you may ever encounter. Begin to acquire this knowledge now — you will be a better engineer for it. The Timken Roller Bearing Company, Canton 6, Ohio.

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***TAPERED ROLLER BEARINGS***

KEEPING UP WITH

## Electricity

**BROADCASTING TIN.** "Flowing" tin plate by induction heating is now accepted practice in the industry. Frequency used in the first installation was 200,000 cycles per second—and the equipment was salvaged from a discarded broadcasting unit! Incidentally, this first installation is still in daily use.

**IT'S A MATTER OF SPEED.** Radium gives out 1,200,000 times as much energy as the same weight of coal burned with oxygen. Even if we had plenty, however, it would probably be a poor substitute for coal, since it releases energy only one-eightieth as rapidly. Nothing that scientists have been able to do has had the slightest effect in speeding up the process.

**THE SUN IS STILL SLOWER,** releasing energy by a process which involves the transmutation of elements and takes between six and seven million years.

**WOMAN'S WEAPON.** One reason that electric irons aren't being made is that the thermostats used to control their temperature are busy on land, sea and air. They're guarding against motor trouble in tanks, fire danger in planes, overheating in gun equipment on battleships.

**PEAK FLATTENERS.** Resistance welders have speeded up production in thousands of war plants, but they have imposed enormous on and off single-phase loads on power circuits, often building up impossible peak demands. Capacitors are proving to be the answer, correcting the power factor to approximate unity.

**THE HIGHER, THE FEWER** no longer applies in radio vibrators. At high altitudes, vibrator contacts literally "boiled away" in ten hours, hence this type of radio was seldom used in airplanes. New-type vibrator, using Westinghouse-developed materials and techniques, has a life expectancy equal to that of the plane.

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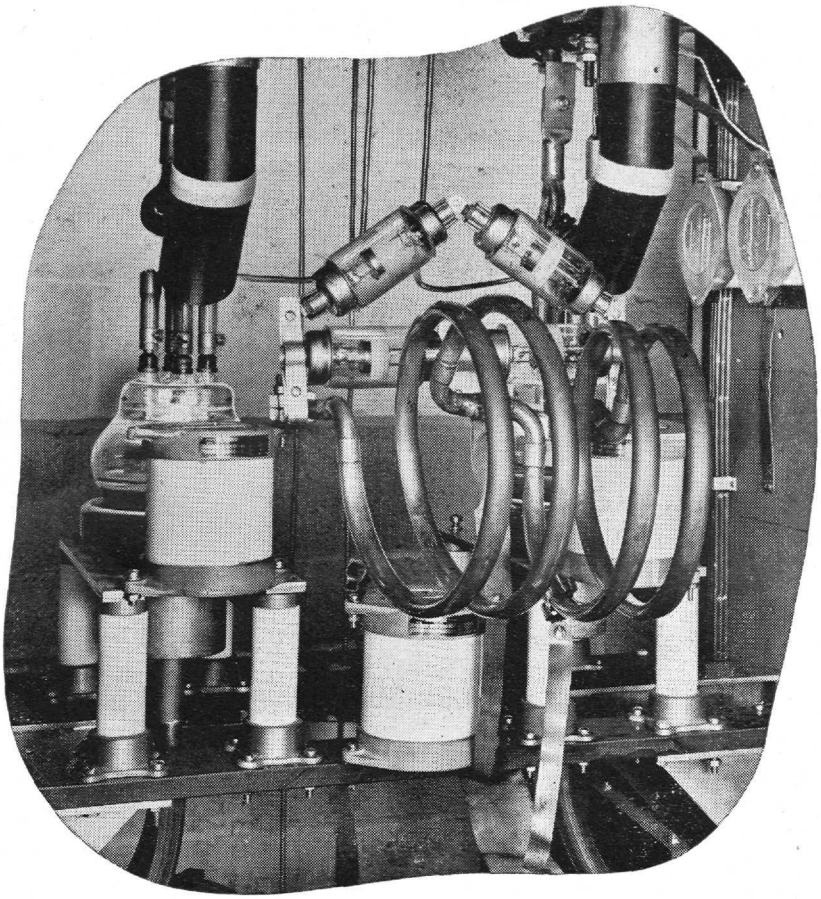
The above items are condensed excerpts from articles in the WESTINGHOUSE ENGINEER, a bi-monthly engineering review. Regular subscription price—$2.00 a year. *Special price to students—50¢.*



# Plastics, plywood and electronics

This is a Westinghouse laboratory set-up for research in dielectric heating—internal heating by high-frequency radio waves. Together with induction heating—surface heating of metals by high-frequency radio waves—this process is daily finding new applications in industry.

One outstanding use of the principle of high-frequency heating is the Westinghouse development of flowing of tin on steel strip. Other important applications are in the bonding of plywood and the curing of plastics.

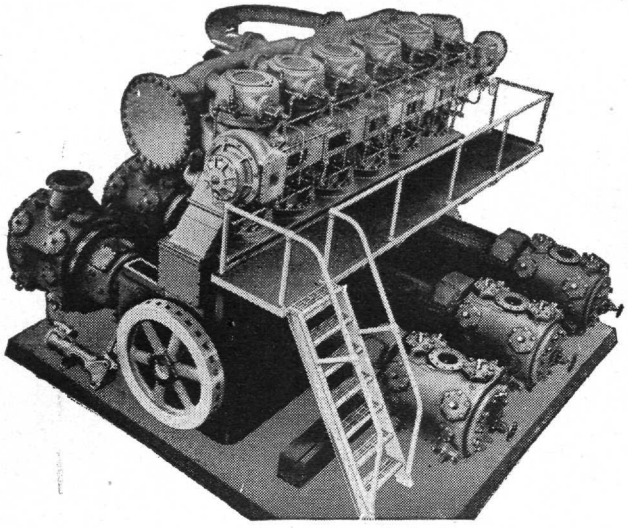
Dielectric and induction heating effect important savings in time and materials with attendant benefits of better control and more uniform results.

High-frequency heating is an example of electronics at work, another phase of Westinghouse leadership in electricity. Westinghouse Electric & Manufacturing Co., Pittsburgh 30, Pa.

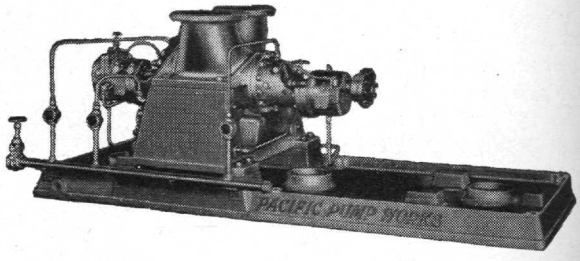
WESTINGHOUSE PRESENTS: *John Charles Thomas, Sunday, 2:30 p.m., E.W.T., NBC. "Top of the Evening," Mon. Wed. Fri. 10:15 p.m., E.W.T., Blue Network.*

**Westinghouse**

PLANTS IN 25 CITIES OFFICES EVERYWHERE



CLARK 6 Cyl. 3000 B. H. P.
STEAM ENGINE DRIVEN COMPRESSOR




Pacific Type HV—Double Suction, Single-Stage, High Temperature, High Pressure Centrifugal Pump.

# Achievements in the Field

Three thousand Horses corraled in a 20′ x 20′ space! Figuratively, that's what the Clark 6-cylinder steam driven compressor does. 3000 surging Horse Powers in a single compressor.

You'd require 30 of the old type 100 Horse Power horizontals to equal this power delivery. And then only with nearly 30 times the space and maintenance cost.

Formerly the Synthetic Ammonia industry used the old cumbersome horizontal compressor which originally was of German design. The Clark Steam Engine Driven Compressor now replaces these and does the job better and cheaper.

You'll find the same type of Clark compressor performing in the synthetic rubber and synthetic alcohol plants.

Imagine high pressure centrifugal pumps with discs whirling at 3500 R. P. M. within a third of a hair's breadth of scraping the housing—then having oil or other liquids of 850 degrees poured against those discs without expanding and jamming the works.

With new alloys and a revolutionary cooling system, Pacific engineers developed this new pumping technique—pumps that perform with precision, not only at 850 degrees but also at sub-zero and all the intervening degrees.

That's the kind of punishment Pacific Engineered Pumps are built to take. The world over, in oil refineries, power plants, wherever liquids, hot or cold, are centrifugally pumped, Pacifics are giving long years of economical, dependable service.

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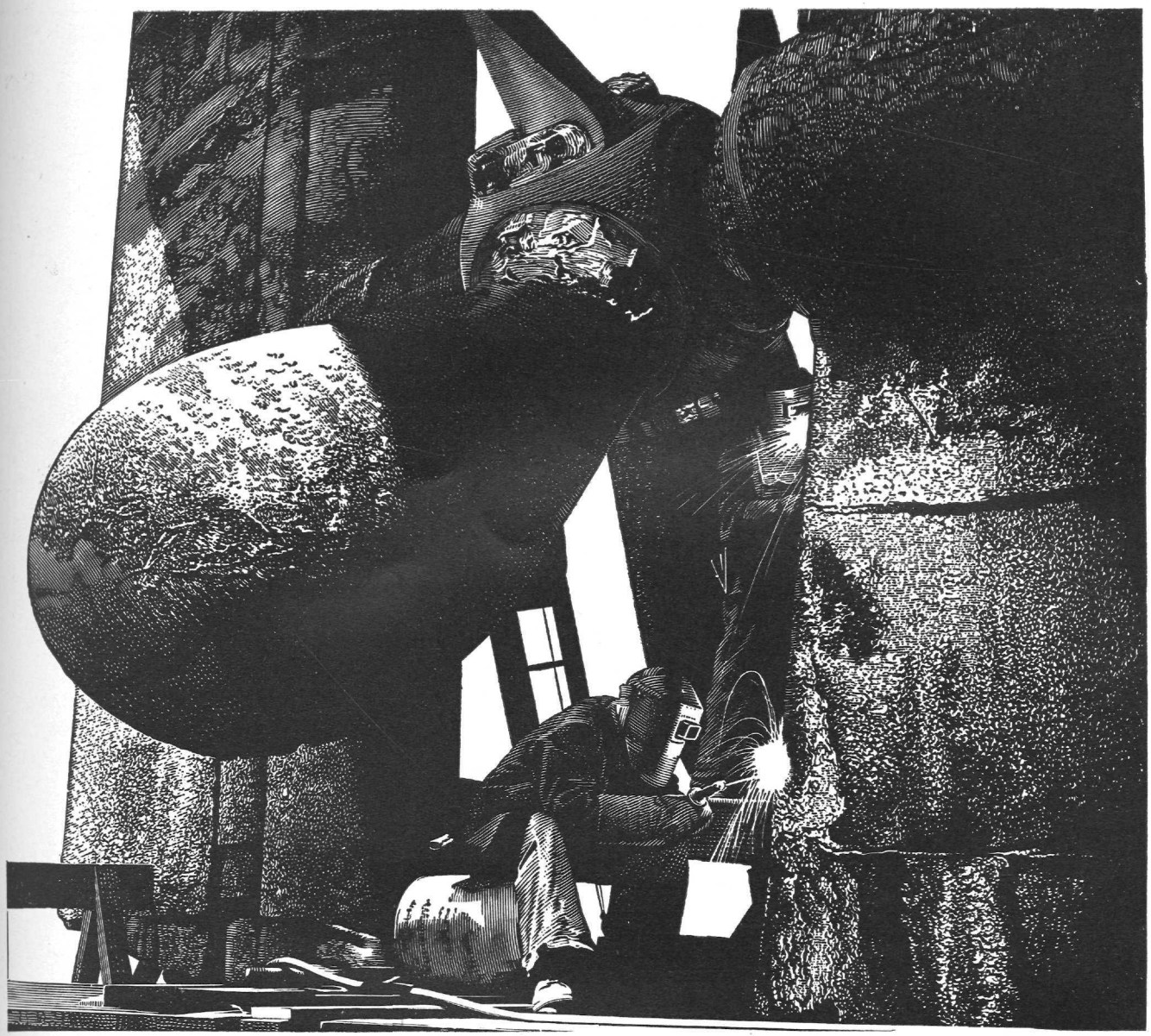
**PACIFIC PUMPWORKS**
**5715 Bickett St., Huntington Pk., Cal.**

*"Two of the Dresser Industries"*



# REPAIRING DAMAGED LINKS IN OUR LIFELINES

WITHOUT benefit of ceremonies, American ship repair yards are regularly performing one of the most gigantic and least publicized jobs of the war . . . a task which is vital to maintaining a constant flow of troops and materials over our trans-oceanic highways. As evidence of the scope of this achievement, in 1942 alone American shipyards completed repairs on over 12,000 ships of all sizes.

In this big war job, as in the huge ship construction program, the oxyacetylene flame and the electric arc are indispensable. These speedy modern tools provide the fastest and most flexible method of cutting and joining heavy steel ship plates . . . whether it be for production, maintenance or repair. Similarly in many other vital war industries, the oxyacetylene flame and electric arc have made possible unprecedented production records. Their proven speed, efficiency and versatility in war production foreshadows their increased importance in future peacetime manufacturing.

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# The OHIO STATE ENGINEER

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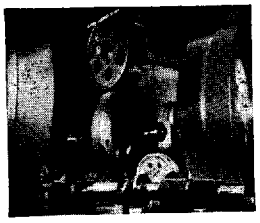
## Our Cover

The Navy's new destroyer-escort which is smaller than a destroyer, yet larger and more powerful than the British corvette.
—*Courtesy Westinghouse.*



## Our Frontispiece

These large bull gears, some are 35 tons in weight, have a tolerance of 0.0003 of an inch.
—*Courtesy General Electric.*


**EDWARD W. BAILEY, *Editor*** **KENNETH C. LACY, *Bus. Mgr.***

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